

CLAIMS

We claim:

1. A di-alkyl phthalate characterized by a carbonyl number below about 0.2 mg KOH/g, a light ends content of less than about 1000 ppm wt, and a liquid volume resistivity (LVR) that is:
 - i) greater than about 0.3×10^{12} ohm.cm in the case where the di-alkyl is di-2-ethyl hexyl;
 - ii) greater than about 0.6×10^{12} ohm.cm in the case where the di-alkyl is di-isononyl; and
 - iii) greater than about 1.35×10^{12} ohm.cm in the case where the di-alkyl is di-isodecyl.
2. The phthalate of claim 1 wherein the LVR is
 - i) greater than about 0.5 in the case where di-alkyl is di-2-ethyl hexyl;
 - ii) greater than about 0.7 in the case where di-alkyl is di-isononyl; and
 - iii) greater than about 2.0 in the case where di-alkyl is di-isodecyl.
3. The phthalate of claim 1 wherein the carbonyl number is \leq about 0.1 mgKOH/g or less.
4. The phthalate of claim 1 wherein the light ends content is $<$ about 600 ppm wt.
5. The phthalate of claim 3 wherein the light ends content is $<$ about 600 ppm wt.
6. The phthalate of claim 1 comprising intermediates in an amount \leq 750 ppm wt.
7. The phthalate of claim 6 having a combined light ends and intermediates content below about 1000 ppm wt.

8. A polyvinyl chloride composition comprising polyvinyl chloride plasticized with a phthalate according to claim 1.
9. A method for producing insulated wire or cable comprising coating the wire or cable with a polyvinyl chloride composition comprising polyvinyl chloride plasticized with a di-alkyl phthalate having by a carbonyl number below about 0.2 mg KOH/g, a light ends content of less than about 1000 ppm wt, and an LVR (in units of 10^{12} ohm.cm) that is:
 - i) greater than about 0.3 in the case where di-alkyl is di-2-ethyl hexyl;
 - ii) greater than about 0.6 in the case where di-alkyl is di-isononyl; and
 - iii) greater than about 1.35 in the case where di-alkyl is di-isodecyl.
10. A process for the production of a plasticiser ester comprising:
 - (i) esterifying an acid or an anhydride with an alcohol containing from 6 to 13 carbon atoms to form a crude ester;
 - (ii) treating the crude ester with a base to form a treated ester;
 - (iii) filtering the treated ester to separate a liquid product;
 - (iv) stripping the liquid product to form a stripped material;
 - (v) treating the stripped material with an adsorbent; and
 - (vi) filtering the product of step (v), optionally in the presence of a filter aid, to remove the adsorbent from the plasticiser ester.
11. The process according to claim 10 wherein the base is an alkali metal salt.
12. The process according to claim 10 wherein the base is selected from the group consisting of sodium hydroxide and sodium carbonate.
13. The process according to claim 10 comprising removing water from the treated ester before filtering step (iii).
14. The process according to claim 13 wherein the water is removed by flashing or steam stripping.

15. The process according to claim 10 wherein the acid or anhydride is selected from the group consisting of aromatic monocarboxylic acids and anhydrides, and polybasic aromatic carboxylic acids and anhydrides.
16. The process according to claim 10 wherein the anhydride is phthalic anhydride.
17. The process according to claim 10 wherein the alcohol is a C₉ to C₁₁ alcohol.
18. The process according to claim 17 wherein the alcohol is selected from the group consisting of a C₁₀ alcohol and a C₁₁ alcohol.
19. The process according to claim 10 wherein the combined amount of adsorbent and the filter aid employed is from about 0.01 to about 5 wt%, based on the weight of the plasticiser ester.
20. The process according to claims 10 wherein steps (v) and (vi) are enabled by employing a mixture of filter aid and adsorbent in step (v).
21. The process according to claim 20 wherein the mixture contains from about 90 to about 30 parts by weight of the filter aid and from about 10 to about 70 parts by weight of the adsorbent.
22. The process according to claim 10 wherein the adsorbent is activated carbon.
23. The process according to claim 10 wherein the filter aid is a clay.

24. The process according to claim 10 wherein the filter aid is present and is a clay, and the adsorbent is activated carbon.
25. The process according to claim 10 wherein the adsorbent also acts as the filter aid.
26. The process according to claim 10 wherein the treatment step (v) is performed at a temperature in the range of about 20 to about 180°C.
27. The process according to claim 10 wherein the treatment step (v) is performed at a temperature in the range of about 80 to about 120°C.
28. The process according to claim 10 wherein the treatment step (v) is performed at a temperature in the range of about 80 to about 120°C and in which the plasticizer ester is a C₈ to C₁₃ dialkyl phthalate.
29. The process according to claim 10 wherein the plasticizer ester comprises a di-alkyl phthalate characterised by a carbonyl number below 0.2 mg KOH/g, a light ends content of less than 1000 ppm wt, and a liquid volume resistivity (LVR) (in units of 10¹² ohm.cm) that is:
 - i) greater than about 0.3 in the case where di-alkyl is di-2-ethyl hexyl;
 - ii) greater than about 0.6 in the case where di-alkyl is di-isononyl; and
 - iii) greater than about 1.35 in the case where di-alkyl is di-isodecyl.
30. A polyvinyl chloride composition comprising polyvinyl chloride plasticized with a plasticizer ester produced by the process according to claim 10.
31. A method for producing insulated wire or cable comprising coating the wire or cable with a polyvinyl chloride composition according to claim 30.

32. A method for purifying a plasticizer ester which comprises forming a mixture of the ester and an adsorbent having a pH in the range of about 6 to about 11, and subsequently filtering the mixture.
33. The method according to claim 32 wherein the pH of the adsorbent is in the range about 6 to about 9.
34. The method according to claim 32 wherein the adsorbent comprises activated carbon and wherein the mixture also comprises a filter aid having a pH in the range of about 6 to about 11.
35. The method according to claim 34 wherein the pH of the filter aid is in the range about 6 to about 9.
36. The method according to claim 35 wherein the pH of the adsorbent is in the range about 6 to about 9.
37. The method according to claim 32 wherein the plasticizer ester comprises a di-alkyl phthalate characterised by a carbonyl number below about 0.2 mg KOH/g, a light ends content of less than about 1000 ppm wt, and a liquid volume resistivity (LVR) (in units of 10^{12} ohm.cm) that is:
 - i) greater than about 0.3 in the case where di-alkyl is di-2-ethyl hexyl;
 - ii) greater than about 0.6 in the case where di-alkyl is di-isononyl; and
 - iii) greater than about 1.35 in the case where di-alkyl is di-isodecyl.
38. A polyvinyl chloride composition comprising polyvinyl chloride plasticized with a plasticiser ester purified by the method according to claims 32.
39. A method for producing insulated wire or cable comprising coating the wire or cable with a polyvinyl chloride composition according to claim 38.